

REMARKS

Applicant has canceled the claims 1 to 12 without prejudice and added new claims 13 through 35 and amended the title and specification. Applicant respectfully submits that these amendments to the claims, title and specification are supported by the application as originally filed and do not contain any new matter(see Paragraphs 0002, 0005 and 0024 through 0038 of publication No. 2006/0150436). Accordingly the Office Action will be discussed in terms of the amendments.

The Examiner has rejected the claims 5 through 8 under 35 USC 112, second paragraph. Applicant has canceled these claims and added new claims 13 through 34. Applicant respectfully submits that these new claims 13 through 35 comply with the requirements of 35 USC 112, second paragraph.

The Examiner has rejected the claim 1 under 35 USC 102 as being anticipated by Japanese 38-18449 stating that JP '449 shows a heating chamber having at its lower end a discharge port 3 and therein a thermo conductive heating means 5 and a hopper chamber 4 connected to the upper end of the heating and drying chamber; wherein said heating and drying chamber and said hopper chamber constitute an integrally combined material storage processing tank for powdered or granular material.

In reply to this rejection, Applicant would like to first point out that the technical problem to be solved in the present invention is to improve the efficiency of the entire production and process system using a powder or granular material as a raw material taking into account the process ability and heating and drying efficiency of the processing apparatus such as the molding machine as disclosed in the paragraph [0005]. And the present invention is proposed to solve such problems.

According to the invention described in the new claim 13, the powdered or granular material stored in the material storage processing tank comprised of an upper hopper chamber and a lower heating and drying chamber is heated and dried in the heating and drying chamber by a thermal conductive heating means while being depressurized. Thereby, the powdered or granular material can be heated and dried in the heating and drying chamber by decompression and thermal conduction, so that it can be efficiently dried. Also the powdered or granular material stored in the material storage processing tank is designed to be heated and dried in the lower heating and drying chamber, so that all of the powdered or granular

material stored in the material storage processing tank is not heated and dried wastefully. When the processing capacity of the processing apparatus to which the heated and dried powder or granular material is supplied is relatively small, the amount of powdered or granular material which meets the processing capacity can be supplied after heated and dried in the heating and drying chamber, so that waste energy can be reduced and the heater is not required to be enlarged. In the structure of the present invention the powdered or granular material stored in the hopper chamber is designed to be fed into the heating and drying chamber by gravity accompanied by the discharge of heated and dried powdered or granular material from the discharge port.

In view of the above, the charging operation of the powdered or granular material into the material storage processing tank can be reduced, thereby enabling to heat and dry the powdered or granular material in the heating and drying chamber more efficiently. Namely, in the prior depressurized drying hopper, the depressurized condition in the drying hopper is broken when the material is discharged or charged and the hopper is required to be returned to the depressurized condition each time. However, according to the present invention, discharge of the material from the heating and drying chamber and supply of material from the hopper chamber to the heating and drying chamber are synchronized, so that breakage of depressurized condition can be reduced and the efficiency of heating and drying can be improved. Still further, in the present invention, the content of the hopper chamber and that of the heating and drying chamber are appropriately set depending on the processing capacity of the processing apparatus to be supplied with the dried powdered or granular material, thereby achieving efficient heating and drying of the powdered or granular material in the heating and drying chamber and reduction of charging operation of the powdered or granular material into the material storage processing tank for powdered or granular material.

In reply to this rejection and keeping in mind the above, Applicant respectfully submits that the dryer described in JP '449 is for mainly drying grain in which a drying chamber connecting a material tank at the upper end and a discharge port at the lower end is provided and a bucket conveyer apparatus is provided between the discharge port and the material tank. The right and left walls of the drying chamber are designed to be provided with a wire-mesh so as to pass through a heated air and a plurality of heating tubes for passing a heated air therein are installed. Still further, in JP '449 the technical problem is to uniformly

dry a product to be processed and it is described that the product can be uniformly dried by circulating the product through the material tank, the drying chamber and the bucket conveyer apparatus sequentially. Namely, Applicant respectfully submits that JP '449 discloses uniformly drying the product by circulating it. It does not disclose the technical idea of the present invention in that the processing capacity of the processing machine such as a molding machine and the heating and drying efficiency are taken into account. Further, the structure, operation and effect of the JP '449 are remarkably different from those of the present invention.

Accordingly, Applicant respectfully submits that JP '449 does not disclose each and every element of Applicant's invention as claimed by claim 13 and the claim 13 is not anticipated thereby.

The Examiner has rejected the claims 2 through 6, 8 and 9 under 35 USC 103 as being obvious over JP '449 in view of Tada stating that JP '449 discloses all of the elements of the present invention except for the particular construction of the heater; Tada teaches a material storage processing tank having an airtight construction and is capable of being depressurized in its inner by means of a decompression means 27 and a thermo-conductive heater means comprising a heating source and a thermo-conductive means through which heat generated from the heating source is conducted into the powder or granular material stored in the heating and drying chamber which includes an inner tube unit, an outer tube unit and a first heater and a plurality of fins; and it would have been obvious to one of ordinary skill in the art to modify JP '449 in view of the teachings of Tada.

In reply to this rejection, Applicant would like to incorporate by reference his comments above concerning Applicant's invention and JP '449.

Applicant has carefully reviewed Tada and respectfully submits that in the dehumidifying and drying apparatus for powdered or granular material disclosed in the Tada, the hopper is depressurized by a vacuum pump and the powdered or granular material is heated by a heating means and a thermal conductive means. Still further, in Tada, Applicant respectfully submits that the structure corresponding to the hopper chamber of the present invention is not provided and all of the powdered or granular material stored in the drying hopper is heated and dried by the heating means and the thermal conductive means. According to such a structure, when the processing capacity of the processing apparatus such

as a molding machine is relatively small, this causes an energy waste for heating and drying the powdered or granular material in the drying hopper by means of the heating means and the heat conductive means. On the other hand, according to the present invention, the powdered or granular material stored in the material storage processing tank is designed to be heated and dried in the lower heating and drying chamber, so that all of the powdered or granular material stored in the material storage processing tank is not heated and dried wastefully.

Still further, according to the Tada, when the powdered or granular material stored in the drying hopper is discharged from the discharge port and the powdered or granular material in the drying hopper is reduced, the powdered or granular material is charged from the collecting hopper via the material feed valve. In such a structure, the drying hopper which is kept decompressed is returned to the atmospheric pressure each time the material feed valve is opened, so that the drying hopper is required to be depressurized again, thereby wasting energy. On the other hand, according to the present invention, as mentioned above, the powdered or granular material stored in the hopper chamber is designed to be fed into the heating and drying chamber by gravitation when the heated and dried powdered or granular material is discharged from the discharge port. Therefore, the depressurized condition in the hopper chamber or the heating and drying chamber is not destroyed for charging the powdered or granular material and the powdered or granular material stored in the hopper chamber can be fallen and supplied in the heating and drying chamber by the gravity, thereby efficiently heating and drying the powdered or granular material.

In view of the above, therefore, Applicant respectfully submits that the combination suggested by the Examiner is not Applicant's invention and the claims 14 through 35 are not obvious over JP '449 in view of Tada.

The Examiner has rejected the claims 10 and 12 under 35 USC 103 as being obvious over JP '449 in view of Tada and further in view of JP '289 stating that the combination of JP '449 and Tada disclose all of the present invention except for a collector whereby a powdered or granular material collected in the feeder is fit into a processing apparatus for powdered or granular material; JP '289 teaches a collector for a processing apparatus for powdered or granular material whose purpose is to provide a buffer supply of pellets to facilitate continuous extrusion and thus reduce down time; and it would have been obvious to one of

ordinary skill in the art to modify the combination of JP '449 and Tada as suggested by JP '289.

In reply to this rejection, Applicant would like to incorporate by reference his comments above concerning Applicant's invention, JP '449 and Tada. In addition, Applicant has carefully reviewed JP '289 and respectfully submits that it merely discloses temporarily storing the dry molding material 13 in the upper communication passage 22 and the hopper 26.

In view of the above, therefore, Applicant respectfully submits that the combination suggested by the Examiner is not Applicant's invention and the claims 23, 25 and 26 through 35 are not obvious over JP '449 in view of Tada and further in view of JP '289.

The Examiner has rejected the claim 11 under 35 USC 103 as being obvious over JP '449 in view of Tada and JP '289 and further in view of Saeman stating that the combination of JP '449, Tada and JP '289 disclose all of the present invention except for a circulation pipe for the purpose of the circulating; and it would have been obvious to one of ordinary skill in the art to modify the combination of JP '449, Tada and JP '289 in view of the teachings of Saeman.

In reply to this rejection, Applicant would like to incorporate by reference his comments above concerning Applicant's invention, JP '449, Tada and JP '289. Applicant has further carefully reviewed Saeman and respectfully submits that while it may disclose a recycle pipe 25, Applicant respectfully submits that the recycle pipe is for the purpose of recycling the particulate material for further drying and is not for the purpose of eliminating the problems associated with extrusion stoppages. Accordingly, Applicant respectfully submits that one of ordinary skill in the art would not make the combination suggested by the Examiner.

In view of the above, therefore, Applicant respectfully submits that not only is the combination suggested by the Examiner not Applicant's invention but also the combination suggested by the Examiner would not be obvious to one of ordinary skill in the art. Therefore, Applicant respectfully submits that the claim 24 is not obvious over JP '449, Tada, JP '289 and further in view of Saeman.

The Examiner has rejected the claim 11 under 35 USC 103 as being obvious over JP '449 in view of Saeman. In reply to this rejection, Applicant would like to incorporate by

reference his comments above concerning Applicant's invention, JP '449 and Saeman and respectfully submits that the combination suggested by the Examiner is only not Applicant's invention but also would not be suggested to one of ordinary skill in the art and the claim 24 is not obvious thereover.

The Examiner has rejected the claim 7 under 35 USC 103 as being obvious over JP '449, Tada, JP '289 and further in view of Evans stating that the combination of JP '449, Tada and JP '289 discloses all of the present invention except for a cover for the purpose of closing the apparatus; Evans teaches a cover for the purpose of closing the apparatus; and it would have been obvious to one of ordinary skill in the art to modify the combination of JP '449, Tada and JP '289 as taught by Evans.

In reply to this rejection, Applicant would like to incorporate by reference his comments above concerning Applicant's invention, JP '449, Tada and JP '289. Applicant has carefully reviewed Evans and respectfully submits that while Evans may disclose a simple cover 14, the apparatus of Evans is quite different from Applicant's invention and JP '449 and one of ordinary skill in the art would not be suggested to make a combination of Evans and JP '449.

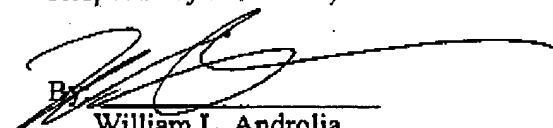
In view of the above, therefore, Applicant respectfully submits that not only is the combination suggested by the Examiner not Applicant's invention, but also the combination suggested by the Examiner would not be suggested to one of ordinary skill in the art. As a result, Applicant respectfully submits that the claims 15 through 18 are not obvious over JP '449, Tada, JP '289 and further in view of Evans.

The Examiner has rejected the claim 7 under 35 USC 103 as being obvious over JP '449 in view of Evans. In reply to this rejection, Applicant would like to incorporate by reference his comments above concerning Applicant's invention, JP '449 and Evans. As a result, Applicant respectfully submits that not only is the combination suggested by the Examiner not Applicant's invention but also the combination suggested by the Examiner would not be suggested to one of ordinary skill in the art. Therefore, Applicant respectfully submits that the claims 15 through 18 are not obvious over JP '449 in view of Evans.

In view of the above, therefore, it is respectfully requested that this amendment be entered, favorably considered and the case passed to issue.

Please charge any additional costs incurred by or in order to implement this Amendment or required by any requests for extensions of time to QUINN EMANUEL DEPOSIT ACCOUNT NO. 50-4367.

Respectfully submitted,

  
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